CLAIMS

[Claim(s)]

[Claim 1] The attachment material which has the axle hole plate part bent in the right-angled direction to the attachment plate part attached to the main part side of equipment, The rotation shaft which has the attachment which the axle hole of the rotation is made possible to the axle hole hole prepared in said axle hole plate part of this attachment material, and is attached to the opening-and-closing object side, Said rotation shaft is made to insert in the insertion hole prepared in that central part between the 1 sides of the major diameter of this rotation shaft, and said axle hole plate part. The 1st friction washer which it is made to rotate with this rotation shaft, or was stopped by the axle hole plate part and formed, The 2nd friction washer which it is made to rotate with said rotation shaft, or it was stopped by the axle hole plate part and formed making the narrow diameter portion of said rotation shaft insert in to the insertion hole prepared in the central part in contact with the other sides of said axle hole plate part, The elastic means which was established making said modification narrow diameter portion insert in to the insertion hole prepared in that central part in contact with this 2nd friction washer and which consists of the singular number or two or more spring washers, a plate spring, a wave washer, etc., It consists of the washer for control formed so that it might rotate with said rotation shaft, carrying out insertion engagement of said modification narrow diameter portion to the modification insertion hole prepared in that central part in contact with this elastic means, The tilt hinge characterized by providing or including the following By closing the side projected from the washer for control of said modification narrow diameter portion While constituting so that friction torque may occur the either side of the both-sides sides of said 1st friction washer, respectively in the either side of the both-sides sides of said 2nd friction washer The click plate to which elasticity was given while rotating with said rotation shaft to the either side of said axle hole plate parts It inhales between this click plate and said attachment material, and is a mechanism.

[Claim 2] Said suction mechanism is a tilt hinge characterized by constituting from the slot established in said click plate, a crevice or a pore, and a convex part prepared in this slot, the crevice, or the pore at said attachment material side that it should fit in just before the closing position of said opening-and-closing object.
[Claim 3] Said suction mechanism is a tilt hinge characterized by constituting from a convex part prepared in said click plate, and the slot established in said attachment material side in order to accept this convex part just before the closing position of said opening-and-closing object, a crevice or a pore.
[Claim 4] said click plate -- simultaneous -- said 1st friction washer -- and -- or -- the Claims 1-3 characterized by serving as said 2nd friction washer are not -- a tilt hinge given in **.

DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Field of the Invention] Especially, this invention is used as an object for opening and closing of the display object of OA equipment, such as a notebook computer or a laptop type personal computer, and relates to a suitable tilt hinge.
[0002]
[Description of the Prior Art] In order to carry out stable maintenance of the opening-and-closing object (display device) at a middle Kaisei angle in the tilt hinge for OA equipment conventionally The attachment material which has the axle hole plate part bent in the right-angled direction to the attachment plate part which is boiled and is attached to the main part side of equipment as a thing only using a friction mechanism, The rotation shaft which has the attachment attached to the axle hole hole prepared in said axle hole plate part of this attachment material to the opening-and-closing object side the axle hole of the rotation of was made possible, The 1st friction washer which make insert said rotation shaft in the insertion hole prepared in that central part between the 1 sides of the major diameter of this rotation shaft, and said axle hole plate part, and it is made to rotate with this rotation shaft, or was stopped by the axle hole plate part and formed, The 2nd friction washer formed carrying out insertion engagement of said modification narrow diameter portion to the modification insertion hole prepared in the central part in contact with the other sides of said axle hole plate part so that it might rotate with said rotation shaft, The elastic means which was established making said modification narrow diameter portion insert in to the insertion hole prepared in that central part in contact with this 2nd friction washer and which consists of the , It is said rotation shaft, carrying out insertion engagement of said modification narrow diameter portion to the modification insertion hole prepared in that central part in contact with this elastic means. By consisting of the formed

washer for control so that it may rotate, and closing the side projected from the washer for control of said modification narrow diameter portion said 1st friction washer and said major diameter -- and -- or what was constituted so that friction torque might occur, respectively between said 2nd friction washer, said axle hole plate part, or a spring washer is well-known between axle hole plate parts.

[0003]

[Problem(s) to be Solved by the Invention] Although the conventionally well-known tilt hinge mentioned above has the advantage that an opening-and-closing object can be certainly held stably with a middle Kaisei angle with easy composition and it is adopted as OA equipment, such as many personal computers Since it is fixed in the full open closed angle of an opening-and-closing object, when friction torque closes an opening-and-closing object, in order that anti-power may remain, the lock mechanism is independently used between the opening-and-closing object and the main part of equipment in order to press down this anti-power.

[0004] the tilt hinge constituted so that anti-power could be removed, even if it did not independently establish a lock mechanism by inhaling the purpose of this invention to a tilt hinge, and adding a mechanism -- it is going to provide -- it is.

[0005]

[Means for Solving the Problem] The attachment material which has the axle hole plate part bent in the right-angled direction to the attachment plate part which attaches this invention to the main part side of equipment in order to attain the purpose mentioned above, The rotation shaft which has the attachment which the axle hole of the rotation is made possible to the axle hole hole prepared in said axle hole plate part of this attachment material, and is attached to the opening-and-closing object side, Said rotation shaft is made to insert in the insertion hole prepared in that central part between the 1 sides of the major diameter of this rotation shaft, and said axle hole plate part. The 1st friction washer which it is made to rotate with this rotation shaft, or was stopped by the axle hole plate part and formed, The 2nd friction washer which it is made to rotate with said rotation shaft, or it was stopped by the axle hole plate part and formed making the narrow diameter portion of said rotation shaft insert in to the insertion hole prepared in the central part in contact with the other sides of said axle hole plate part, The elastic means which was established making said modification narrow diameter portion insert in to the insertion hole prepared in that central part in contact with this 2nd friction washer and which consists of the singular number or two or more spring washers, a plate spring, a wave washer, etc., It consists of the washer for control formed so that it might rotate with said rotation shaft, carrying out insertion engagement of said modification narrow diameter portion to the modification insertion hole prepared in that central part in contact with this elastic means. By closing the side projected from the washer for control of said modification narrow diameter portion While constituting so that friction torque may occur the either side of the both-

sides sides of said 1st friction washer, respectively in the either side of the both-sides sides of said 2nd friction washer The click plate to [illegible] o the either side of said axle hole plate parts is prepared. Inhale between this click plate and said attachment material, establish and constitute a mechanism, an opening-and-closing object is made to **** in the closing direction according to this suction mechanism just before that stoppage position, and the anti-power produced according to a friction mechanism at the time of closing of an opening-and-closing object is negated.

[0006] This invention can consist of the slot, crevice or pore which prepared said suction mechanism in said click plate, and a convex part prepared in this slot, the crevice, or the pore at said attachment material side that it should fit in just before the closing position of said opening-and-closing object in that case.

[0007] It can constitute from a convex part which prepared this invention and also said suction mechanism in said click plate, and the slot established in said attachment material side in order to accept this convex part just before the closing position of said opening-and-closing object, a crevice or a pore.

[0008] and this invention -- said click plate -- simultaneous -- said 1st friction washer -- and -- or it can serve as said 2nd friction washer.

[0009]

[Embodiment of the Invention] Drawings show the form of 1 implementation of this invention, 1 is attachment material attached to the main part A side of equipment, and the attachment plate part 1a and the axle hole plate part 1b are mutually bent in the shape of L type, and although, it is not limited to the thing of this form. However, fundamentally, the axle hole plate part 1b is formed in the right-angled direction to the attachment plate part 1a. It is located in the surroundings of the circular axle hole hole 1c and this axle hole hole 1c, and 1d of convex parts and the stop holes 1e, such as d'Abo or a pin, are prepared in the axle hole plate part b.

[0010] 2 is the rotation shaft which prepared Attachment 2a, a major diameter 2b and the short modification medium diameter portion 2c that assumed the cross-sectional abbreviation ellipse, and 2d of long modification narrow diameter portions in the direction of an axis. Attachment 2a has shaved off one side of the end part, and has attached the supporter material 3 which supports the opening-and-closing object B there. The axle hole of the rotation of the rotation shaft 2 is made possible to the axle hole hole 1c which established 2d of the modification narrow diameter portion in the axle hole plate part 1b of the attachment material 1.

[0011] 4 is the 1st friction washer, intervenes between the major diameter 2b of the rotation shaft 2, and the axle hole plate part 1b, carrying out insertion engagement of 2d of the modification narrow diameter portions to the modification insertion hole 4a of the cross-sectional ellipse prepared in the central part, and rotates with the rotation shaft 2. In addition,

this 1st the modification insertion hole 4a circular. It is made to stop to the stop slot or stop hole which prepared the piece of a stop prepared in the perimeter in the stop slot established in the major diameter 2b of the rotation shaft 2, or the axle hole plate part 1b, and it enables it to rotate with the rotation shaft 2, or it can prepare so that it may not rotate with the rotation shaft 2.

[0012] which assumed plane abbreviation ladle form, has elasticity, and carries out insertion engagement of the modification insertion hole 5a of the plane abbreviation ellipse prepared there to the modification medium diameter portion 2c of the rotation shaft 2. The suction mechanism C is constituted by this click plate 5 by constituting so that 1d of convex parts, such as d'Abo who Slot 5c was established in the portion of the tail part 5b, and prepared in Slot 5c with the degree of rotation angle of the rotation shaft 2 at the axle hole plate part 1b, or a pin, may fall. In addition, in this suction mechanism C, the slot 5c established in the click plate 5 is good also as the crevice which could make this the crevice or the hole, and prepared the convex part in the click plate 5 side further, and this convex part prepared in the axle hole plate part, or a pore. Furthermore, it may replace with d'Abo who prepares in an axle hole plate part or a pin and also a crevice, or a pore, and these things may be prepared in the attachment plate part 1a side. And by making it engage with the slot or pore which prepared the piece of a stop which protruded from that perimeter in the major diameter of the rotation shaft, you may constitute this click plate 5 so that it may rotate with a rotation shaft.

[0013] 6 is making the piece 6b of a stop which protruded from the perimeter engaged to the stop hole 1e prepared in the axle hole plate part 1b, making the circle-shaped insertion hole 6a which was the 2nd friction washer, touched the other sides of the axle hole plate part 1b, and prepared the one side in the central part insert in to 2d of modification narrow diameter portions. In addition, this 2nd friction washer is constituted so that it may rotate with a rotation shaft, and you may make it friction torque generate it between the axle hole plate parts 1b.

[0014] and is making 2d of modification narrow diameter portions insert in to the circular insertion hole 7a prepared in the central part. In addition, this elastic means can make this plurality, or can make it a wave washer, a plate spring, and a compression spring.

[0015] 8 is a washer for control, touches the elastic means 7 and rotates with the rotation shaft 2 by carrying out insertion engagement of 2d of the modification narrow diameter portions to the plane abbreviation elliptical modification insertion hole 8a prepared in the central part.

[0016] And by closing the washer 8 side for control of 2d of modification narrow diameter portions If the 2nd friction washer 6 is welded by pressure to the elastic means 7, the 1st friction washer 4 is welded by pressure to the axle hole plate part 1b, respectively and the rotation shaft 2 is rotated Friction torque occurs between the 2nd friction washer 6 and the

elastic means 7 between the 1st friction washer 4 and the axle hole plate part 1b.
[0017] In addition, the axle hole plate part 1b is made to stop the 1st friction washer 4 other than the form of the above operation. [make it friction torque make it generate between the 1st friction washer 4, a major diameter 2b, or the click plate 5, or] The 1st friction washer 4 is stopped in neither a major diameter 2b nor the axle hole plate part 1b, but there is also a method of not specifying the part which friction torque generates. Furthermore, [constitute especially the 2nd friction washer 6 so that it may rotate with the rotation shaft 2, when a compression spring is used as an elastic means, constitute so that friction torque may occur between the axle hole plate parts 1b, but] Also when using a spring washer, a plate spring, and a wave washer, you may constitute in this way.
[0018] Furthermore, the click plate 5 may prepare this in the 2nd friction washer 6 side, or it may constitute it so that it may serve both as the 1st friction washer 4 or the 2nd friction washer 6.
[0019] Furthermore, although lubricating oil is made to apply to the portion which generates the friction torque of the 1st friction washer 4 and the 2nd friction washer 6 The singular number, two or more crevices, or the small hole which accumulates lubricating oil in the part which generates the friction of the 1st and 2nd friction washers 4 and 6 in that case may prepare.
[0020] Therefore, if the opening-and-closing object B in the state where it closed to the main part A of equipment is opened, when 1d of convex parts of the axle hole plate part 1b escape from the slot 5c of the click plate 5 which the rotation shaft 2 rotates through the supporter material 4, and both rotates, the opening-and-closing object B will be opened. After an appropriate time, friction torque occurs between the 1st friction washer 4 which rotates with the rotation shaft 2, the axle hole plate part 1b, and the elastic means 7 and the 2nd friction washer 6 which both rotates, and stop maintenance of the opening-and-closing object B is carried out at arbitrary Kaisei angles in a free stop.
[0021] [with the biasing force at the time of 1d of convex parts of the axle hole plate part 1b which 1d of convex parts of the axle hole plate part 1b inhale, and constitutes Mechanism C overcoming the tail part 5b of the click plate 5, and falling to Slot 5c, when closing the open opening-and-closing object B] Since it is closed by inhaling, the opening-and-closing object closed even if anti-power was removed and it omitted the lock mechanism can prevent opening a little.
[0022] In addition, you may stop the instead of stopping the stop slot which prepared the locking part prepared from the perimeter of the 1st friction washer other than the form of the illustrated operation in the major diameter 2b of the rotation shaft 2.
[0023] Furthermore, the axle hole plate part 1b is stopped, and you may make it friction torque occur between the major diameter 2b of the rotation shaft 2, or the click plate 5.
[0024] Furthermore, you may make it friction torque occur according to that time in the both-

sides side of the 1st friction washer 4 without restraining the 1st friction washer 4 in the rotation shaft 2 or the axle hole plate part 1b.

[0025] The rotation shaft 2, the elastic means 7, or the click plate 5 is made to restrain also about the 2nd friction washer 6 (when the click plate 5 is formed in the 2nd friction washer 6 side). making it friction torque occur between the axle hole plate part 1b or the click plate 5 **** -- the above -- you may make it friction torque occur according to that time between the axle hole plate part 1b, the click plate 5, or the elastic means 7, without making anything restrain

[0026] It is also arbitrary to replace with furthermore closing in or and to consider it as a nut with a bundle. There is no limitation in the number of sheets of an elastic means, and the number of sheets of each friction washer. They may be two or more sheets by other Reasons in order to create the friction torque needed.

[0027]

[Effect of the Invention] Since this invention was constituted as mentioned above, it can do the following effects so.

[0028] [easy composition / with the friction torque created in one side each or both-sides side of the 1st and 2nd friction washer at the time of opening and closing of an opening-and-closing object] if constituted like Claim 1 The opening-and-closing object which can carry out stop maintenance of the opening-and-closing object stably at arbitrary Kaisei angles, and was added to the tilt hinge upwards at the time of stoppage of an opening-and-closing object and which was closed since it could inhale and anti-power was removed according to the mechanism can prevent effectively opening a little according to anti-power.

[0029] The effect that the lock mechanism established between the conventional main part of equipment and an opening-and-closing object is omissible after doing so the same effect as Claim 1, when constituted like 3 with Claim 2 can be done so.

[0030] If constituted like Claim 4, the effect that composition can be simplified and manufacture cost can be lowered can be done so by a click plate for exclusive use being omissible.

[Translation done.]